MODULE I

Disasters and their Impacts on Public Health
Presentation Learning Objectives

• Understand what makes a disaster
• Recognize the components of disaster response
• Understand the need for disaster preparedness and training
• Learn about the AAP/PAHO “Pediatrics in Disaster” training program
Disaster

**Disaster:**
A disaster is an event that most often occurs suddenly and unexpectedly, causing trauma to people and/or severe damage to the environment, and exceeds or overwhelms the response capacity of the affected community.

Risk = Hazard x Vulnerability/Capacity
A disaster is the convergence, at a given moment and in a given place, of two factors: risk and vulnerability. ”

(by G. Vilches-Chaux)
SOME KEY DEFINITIONS

**Hazard:** any *potential* threat to public health and safety

**Emergency:** any *actual* threat to public health and safety

**Risk:** the *consequences of exposure* to a hazard

**Vulnerability:** *determinants* of risk

**Capacity:** way the community copes and responds
TYPES OF HAZARDS

Slow Onset:
- Flood
- Drought
- Famine
- Chemical Spill
- Epidemic

Sudden Onset:
- Earthquake
- Cyclone
- Flash Flood
- Road Traffic Accident
- Conflict
SEVERITY OF A DISASTER

- Magnitude of the event
- Vulnerability of the population
- Number of affected people
- Rates of associated diseases
- Crude mortality rate (CMR)
HAZARDS AND EMERGENCIES

• 36 serious earthquakes occur every day around the world
• Only one of them needs an emergency response
• An earthquake which is labelled a disaster occurs once every 3 months
PUBLIC HEALTH IMPACTS OF DISASTERS

- Increased numbers of deaths and injuries
- Population displacements
- New cases of disease and disability
- Exacerbation and increased numbers of cases of psychological and social behaviour disorders
- Possible food shortages and nutritional deficiencies
- Disease from environmental health hazards
- Damage to health facilities and other infrastructure
- Diversion of development resources to emergency relief
TRIGGERING EVENTS

NATURAL FORCES

- Climatic / Geological

HUMAN ORIGIN

- Massive repression or terrorism
  - Massive destruction weapons
  - Chemical or biological weapons
  - Attacks on civilian population

TECHNOLOGICAL

- Industrial accidents

COMPLEX EMERGENCY

- Conflict / Civil war
- Displaced population
- Severe infrastructure losses
- Significant security problems
LEADING CAUSES OF DEATH

- Trauma
- Diarrheal diseases and dehydration
- Communicable diseases: Measles, Malaria, ARI
- Malnutrition
POPULATION WITH MOST VULNERABILITIES

- Children
- Women
  - Pregnant
  - Lactating
  - Without spouse
- Elderly
- Disabled
## PEDIATRIC VULNERABILITIES

<table>
<thead>
<tr>
<th>Category</th>
<th>Vulnerability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>Higher minute volume</td>
</tr>
<tr>
<td></td>
<td>Smaller distance to the floor</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>Higher risk of diarrhea and dehydration</td>
</tr>
<tr>
<td>Skin</td>
<td>Higher body surface area increases skin exposure risk; more susceptible skin</td>
</tr>
<tr>
<td>Endocrine</td>
<td>Increased risk of thyroid cancer from radiation exposure</td>
</tr>
<tr>
<td>Thermoregulation</td>
<td>Increased risk of hypothermia</td>
</tr>
<tr>
<td>Developmental</td>
<td>Less ability to escape environmental dangers or anticipate them</td>
</tr>
<tr>
<td>Psychological</td>
<td>More susceptible to separation anxiety and prolonged stress</td>
</tr>
</tbody>
</table>
ADDED RISKS

Physical victimization
• Rape
• Torture
• Robbery

Exploitation
• Child labor
• Child trafficking / sexual trafficking
• Child soldiering
Special Vulnerabilities of Children

• The psychological and emotional needs of children are often neglected following disasters, particularly when parents and other adults in their lives are having trouble coping with the event themselves.
AGE- SPECIFIC MORTALITY

WHAT DO WE DO?

- Address vulnerabilities
- Minimize risks
- Manage disaster
1. Prevention/ Mitigation
2. Preparedness
3. Emergency response
4. Recovery
PREPAREDNESS

- Risk assessment and vulnerability analysis
- Information management
- Policy and planning
- Resource mobilization
- Coordination and partnership
- Community involvement
- Training and simulation
RESPONSE

- Notification
- Information management and communication
- Coordination among network
- Search and rescue
- Damage and need assessment
- Evacuation and sheltering
- Resource mobilization
RECOVERY

- Reestablish self-sufficiency
- Community planning
- Infrastructure rebuilding
- Health recovery
- Lesson learnt
An earthquake occurs in your region

- Destroyed roads, lack of electricity, inoperable telephone communications, difficult terrain, high altitudes and harsh weather make it difficult to know what is happening in the affected areas
- You serve as a consultant helping to organize and coordinate the emergency response

- **What is your first recommendation?**
Mobilize a Rapid Assessment Team

• Within 48 hours rapid assessment teams are flown into the affected areas by military helicopter
• Doctors, nurses, surgeons, kidney specialists
• Psychologists
• Social workers
• Logisticians
• Water and sanitation experts
• Flight-transport specialists
Rapid Assessment Report

• Tens of thousands of people are affected and are sleeping outside with little shelter from cold and rain
• Thousands have severe wounds including fractures, spinal cord injuries, crush injuries, lacerations, and infections
• Most hospitals have been destroyed

• *What do you recommend?*
Rapid assessment response

• Organize the transport of supplies to the affected areas by helicopter
• Shelter materials
  – blankets
  – sleeping mats
  – winterized tents
• Water Tanks and Pumps
• Food supplies
Rapid assessment response

• Set up field hospitals and medical tents to relieve partially functioning hospitals
• Arrange transport of critical patients from affected areas to out of area hospitals
• Obtain additional dialysis machines to handle large numbers of patients with renal failure secondary to “crush” injuries
• Provide mental health services and counseling (psychologists)
PHASES OF DISASTER MANAGEMENT

1. Prevention/ Mitigation
2. Preparedness
3. Emergency response
4. Recovery
WHAT DO WE DO?

Address vulnerabilities

Minimize risks

Manage disaster
Durante la semana, fuertes lluvias causaron el desborde de varios ríos y una gran cantidad de aludes de tierra o lodo.
La combinación de viento, lluvia, aludes o inundación causaron cortes en la electricidad, la provisión de agua y líneas telefónicas, así como pérdida de hogares y vidas.
Report Card on 10 ESSENTIAL EMERGENCY RELIEF MEASURES (WHO): Hurricanes Katrina and Stan

<table>
<thead>
<tr>
<th>Measure</th>
<th>USA</th>
<th>Guatemala</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do a rapid assessment of the affected population</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Local assessment teams trained and in place</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>2. External assessment teams able to quickly respond</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>3. Secure communications system in place and used</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>4. Secure transportation system available and used</td>
<td>Fail</td>
<td>Fail</td>
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## Report Card on Essential Measures

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>Guatemala</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Provide adequate shelter and clothing</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>3. Provide adequate food</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>4. Provide elementary sanitation and clean water</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>5. Institute a diarrhea control program</td>
<td>Pass</td>
<td>Pass</td>
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### Report Card on Essential Measures

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<tr>
<td>6. Immunize against Measles when appropriate</td>
<td>Pass</td>
<td>Pass</td>
</tr>
<tr>
<td>7. Re-establish and improve primary care medical treatment</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>8. Establish disease surveillance and a health information system to monitor effectiveness of health interventions and realign priorities</td>
<td>Pass</td>
<td>Pass</td>
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</thead>
<tbody>
<tr>
<td>9. Organize human resources</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>10. Coordinate Activities</td>
<td>Fail</td>
<td>Fail</td>
</tr>
<tr>
<td>Overall</td>
<td>Fail</td>
<td>Fail</td>
</tr>
</tbody>
</table>
Need for disaster preparedness and training

Disaster response training at the local level should be a community process involving the health sector (physicians, nurses, hospital, health clinics, private physicians), municipal agencies (fire department, police, sanitation and garbage) disaster response agencies (CONRED, red cross) schools, churches, and community groups such as the Rotary and Lions clubs).
A FINAL WORD

Risk reduction and preparedness are sets of strategies and actions for local communities to prevent *hazards* developing into *emergencies* and *emergencies* into *disasters*.

*(from the 1997 Kobe Conference on Earthquakes and People’s Health)*